

Transcript for Inspecting and Adjusting Robot Switches

First thing to do when testing the robots switches is to park the instrument from the main screen press scenario increment, the red button to park, then press go in a proper park procedure, the robot will move back and forth in the azimuth and zenith direction a few times and then come to a stop. Here you can see that the robot arm continues to spin endlessly which usually suggest a problem with one or more of the switches. In this case, the zenith, if you suspect a problem you'll need to first put it into diagnostic mode to test it in the normal mode under scenario you can see that there are 0's along the top here, this is the standard operating mode to put it into diagnostic mode it's a little bit tricky, you need to press password, increment this is three, 1, 2, 3. Then press word, not password, lawn RAM, MOD and increment the ECR to 2, so you can see the 2 now has been selected. Now you push the green button to return 3 times and then you are ready to go and now when you do scenario now you can see you have a new string of numbers along the top. So what do these numbers represent? There are 4 numbers along the top in two groups on the left is the H horizontal to the azimuth motor that controls the left right motion of the robot and on the right the V vertical is the zenith which controls the up and down motion for each the number on the right is supposed to be between 70 and 100 and these values represent the detection limits of the switch which we will show you in a moment. The number on the left in each case should be ideally 30 units above the value on the right so you can see the 69 here is too low it's less than 70 and also the 115 is more than 40 units above the one on the right. Now as I said it should be 30 greater it can range 20-40 and for the zenith motor the situation is exactly the same the numbers have the same meaning and in this case you can see the number on the right 127 is too high so that suggests that this switch for the zenith motor also needs to be adjusted. You access the zenith motor the first thing you'll have to do is remove the screws with those taken off you can then pull the azimuth motor segment right out of the canister and you have to be careful not to pull on the power cable not too hard because it is still connected. If it's actually necessary to remove completely you want to first disconnect the power plug here so you can completely remove the motor with the azimuth motor removed you can now see the position of the switch it's this back component right here which is held in place by these 2 screws. If you are curious what the switch looks like there is an example here and the little red button is what is physically depressed by the motion of the robot the part of the robot that comes in contact with it is this column which is indicated here and as the robot is turned if you turn it manually for instant you can see this transit across the robot and actually press on to the button of the switch in position to adjust the switch simply loosen the screws so that you can then by hand move the position of the switch in or out relative to the column that will change with settings. One way to start the adjustment is to simply push the switch all the way in and use it as a starting point and if you then go ahead and perform a park maneuver you can see what the new values are. In this case you can see the value is $\frac{1}{2}$ and since that's greater than 100. What that suggests is that the switch is pressed in too far that the number is too big. Another thing to note is if you just completed a park maneuver the column that touches the switch will be located right

in the middle of the switch and what that means is with the switch loosened the presence of the column will actually push the switch out slightly so before you do an adjustment it's better to rotate the robot slightly so that the robot column is not pushing directly on the button. As you make adjustments to the switch another thing you might notice when doing a PARK is that the values all remain 0 and what that indicates is that you've moved the switch too far out and it's not even coming into contact at all with the column so in that case you simply need to move the switch back in and at this point you should know everything you need to adjust the switch it's just a back and forth process moving the position of the switch by a fraction of a mm or so and then running a PARK maneuver and observing the values are within the tolerances recommended by Cimel. Assuming that you don't have a damaged switch this process shouldn't take more than a few minutes. If you do find that you have a switch that is worn out sometimes the buttons do wear out, we can easily send you a replacement. Once you think you've got the values approximately where they need to be, do a final park maneuver. Still in the diagnostic mode and see what the values tell us. OK, here we see the result of the last park the value is 94 which is in the range of 7-100 and the value on the left is 40 units greater than on the right which is just at the limit of acceptable. Once the numbers for the azimuth motor are appearing correctly in the park maneuver we can firmly tighten the switch into place check the power cable connector and return the motor back into the robot canister. To be sure that you keep the associated wires carefully away from the edge so they don't get pinned in place and then just slide it back into place the actual orientation doesn't matter just so long as the holes line up for the screws properly and so we move on to the zenith motor. Remove the screws from the can and also remove the cap that holds the zenith cable in place with the screws and cable cap removed you can tug firmly on the zenith motor casing to remove it and expose the zenith motor. The switches located in a slightly different position but otherwise the switch adjustment process is identical to that used for the azimuth motor. Loosen and adjust the switch perform a park maneuver in the diagnostic mode and continue to do this over and over again until the switch values are acceptable. Tighten the switch firmly in place and slide the canister back on re-attached the cable cap and replace all of the screws. The only thing left to do is switch it back from diagnostic mode to standard mode which is the same set of commands you used before. Password increment 23 word MOD RAM MOD and now reduce to 2 to 0 by pressing yellow twice now you see its 0 and hit return of the green button 3 times now you should be in standard mode if you press scenario you will see the normal 0 values.

Video Name: Switches.avi or Switches.mov

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